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Drug eluting coronary stent

Wahid Khan
National Institute of Pharmaceutical Education and Research, India

Coronary stenting has revolutionized current perspective of coronary artery disease management. Bare Metal Stents (BMS) were introduced first in 1994, but long-term results have been shattered by the dual problems of in-stent restenosis (ISR) and stent thrombosis. Intense work on stent development has successfully led to the introduction of Drug-Eluting Stents (DES) in 2002, as an effort to address restenosis problem. Currently marketed DES's are mainly matrix based systems with drug entrapped in a carrier system. However, biocompatibility and other issues are associated with these matrix carrier systems. In the search for improving the performance of DES various developments are in progress worldwide including use of carrier free DES, use of biodegradable polymers, biodegradable stents, eluting combination drugs from stents etc. Research and developments is primarily centered on increasing the long-term safety and efficacy of stents. In current work, carrier free-drug coated DES has been prepared and evaluated. Developed stent coating method enables fabrication of controllable and homogeneous crystalline drug coatings on stent scaffolds. Continuous release of drug was observed in different release conditions with different release rate. Biocompatibility studies showed no evidence for presence of necrosis, foreign body giant cell reaction or any type of increased severity of inflammatory reaction. The developed crystallization process has wide applicability and may be further implemented for various other drugs especially for effective local drug delivery and bio-design of implantable medical devices.

wahid@niperhyd.ac.in
mail4wahid@gmail.com